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**SUPPLIER BASE MANAGEMENT:
EXPERIENCES FROM THE UK AND GERMANY**

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SUPPLIER BASE MANAGEMENT: EXPERIENCES FROM THE UK AND GERMANY

Abstract

Streamlining the supplier base is a common approach in many US and UK manufacturing companies. However, is this approach being adopted in Germany as fast as it has in the UK? This paper describes research that answers this question and investigates how German companies are managing contacts with their suppliers. The research was conducted in two stages. Firstly, a postal survey of German and UK manufacturers identified the supplier base trends. Secondly, a follow-up telephone survey of a random sample of German plants investigated supplier management processes. The findings show that German manufacturers have not reduced their supplier base by as much as their UK counterparts. However, German manufacturers that have reduced their supplier base perceive significant benefits. Currently, many companies appear to have failed to recognise the potential of working with a reduced supplier base.

Introduction

The management of supplier relationships is a vital task for manufacturers as it can contribute to both the competitiveness and profitability of a company. This is because *supplier management* is concerned with “organising the optimal flow of high-quality, value-for-money materials or components to manufacturing companies from a suitable set of innovative suppliers” [1, p. 422]. Effective supplier management starts with the selection of the most appropriate suppliers, using criteria such as ‘providing high quality parts,’ ‘aggressive pricing’ and ‘reliable delivery.’

Interestingly, many companies have found that it is advantageous to have a smaller supplier base [2,3,4], because fewer suppliers enables manufacturers to achieve volume discounts, reduce administration costs, improve quality, and co-operate on product development. There is much anecdotal evidence of the advantages of supply base reduction and some empirical studies have confirmed this phenomenon in the UK (for example, [1,5]). However, very little empirical research has been conducted in Germany. This is somewhat surprising, because the importance of supplier management to German companies has long been recognised ([6]). Therefore, this paper addresses this omission and presents an empirical investigation of supplier management in German manufacturing companies, contrasted with corresponding practices in the UK. The main aims of the current research are:

- To investigate the supplier base trends of German manufacturers compared to UK companies;
- To explore the views of German managers on supplier management.

Supplier Management

Supplier management is a key aspect of *supply chain management (SCM)*. The scope of SCM “begins with the source of supply and ends at the point of consumption” [7, p. 3). Accordingly, SCM is “the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole,” [8, p. 18]. Supplier management – the upstream relationships – is a key area for most manufacturers, as it can have a significant impact on a company’s costs, its quality, innovation and its competitive position.

The literature review presented in this paper will focus on supplier management. From the articles published in English, three main areas emerge: the importance of supplier management; supplier base reduction; and the selection of suppliers. Each of these will be described separately before moving on to cover the German literature.

The Importance of Supplier Management

Suppliers play a vital role in helping manufacturers to achieve high performance and this has become widely recognised over the past few years. For example, a survey by Monczka et al. [9] showed that whilst in 1995 20% of purchasing and materials managers deemed supplier management to be 'extremely important', 65% of them expected it to be exceptionally important by 1997. Why is this the case?

Effective supplier management can take costs out of the supply chain [10]. In many industries, the management of suppliers can account for as much as 60% and 80% of manufacturing costs [11]. Other potential benefits include on-going improvements in product and service quality by employing just-in-time delivery systems [8], electronic data interchange [12] and quality improvement programmes [13]. Furthermore, involving selected suppliers in new product development can enhance product and process design [14]. Finally, a streamlined supplier base allows partnerships to be formed with the remaining suppliers. Companies, which develop better communication links with their suppliers, achieve better results [15]. Conversely, if the supplier base is too large, co-ordination and interaction becomes costly, time consuming and inefficient.

Supplier Base Reduction

The term 'supplier base' describes the total number of selected suppliers [1,9]. One of the key trends in recent years has been for manufacturers to reduce their total number of suppliers [1,8,16,17,18,19,20,21,22,23]. There is a fair degree of anecdotal evidence to support this view. For example, Sheth and Sharma [18] reported that a number of major manufacturers in the USA have reduced their supplier base, including Motorola (cut by 44%) and Xerox (90% reduction). However,

Sheth and Sharma did not identify the time-scale over which the change in supplier numbers occurred and the figure might well include double counting (a point raised by Lamming [19]).

Reviewing the literature, it becomes obvious that empirical evidence for the reduction in the supplier base is rare – and where it does exist, it comes mostly from the automotive sector. For example, Asmus and Griffin [11] report that ‘world-class’ manufacturers in the automotive sector have reduced their supplier base typically by 50% and have moved to single-sourcing (one supplier per part). In contrast, ‘traditional’ companies have made only small reductions. However, this research was conducted by consultants who did not specify the sources of the data and the sample size. Therefore, this study must be classed as anecdotal evidence only.

In contrast, Goffin et al. [1] made an empirical investigation of supplier base reduction – the first outside the automotive sector. This research was based on a survey of about 200 companies in four industrial sectors in the UK (process, engineering, electronics, and household; see Appendix 1 for details). They found that in process, engineering and electronics sectors the supplier base was streamlined by around 35% between 1991-95. However, the household industry showed a relatively low reduction of 9%.

Finally, Cousins’s [24] recent survey research in medium and large-sized UK companies is worth mentioning. The first part of the study aimed to identify whether strategies to ‘rationalise’ the supply bases are in place. The research did not focus on specific industry sectors and Cousins (ibid.: 147) summarised saying “all of the respondents indicated that they were either undertaking or about to undertake a supplier reduction process, with 77% already actively pursuing such an approach and the remaining 23% either considering or about to embark on the exercise.” Streamlining the supply base has thus developed into a key trend in British industry.

The Selection Process

The selection process is strongly tied to the evaluation of a supplier's performance [25,26,27]. Traditionally, three measures have been used for determining supplier performance: *price*, *delivery* and *quality* [28]. These are also the factors typically applied in supplier selection [29], although *service*, as a fourth dimension, has for some years been used as an additional selection criterion [30]. Manufacturers in the UK automotive sector, however, have recently put great pressure on their suppliers to reduce their prices. This brings into question the suitability of the partnership approach and suggests that a return to traditional supplier management practices is becoming apparent in the UK [31]. Therefore, the automotive sector appears to have come 'full-circle'.

Taking a broader view, it has been argued that focusing mainly on *price* is inappropriate as it is "perhaps one of the most defined characteristics of primitive purchasing" [19, p. 148]. Lamming did not suggest that *price* is unimportant, but the relative emphasis between the four factors (i.e., price, delivery, quality, service) has changed over time. For example, Wilson's [32] research in the US showed that the rankings of the criteria are: (1) quality, (2) service, (3) price and (4) delivery. In addition, other factors are now becoming important. For example, one study in the US automotive industry identified 26 criteria on which supplier selection is commonly based [33]. These included 4 'soft' relationship factors¹ as well as 22 'hard' quantitative criteria. The study was based on a postal survey of 156 purchasing managers. The results clearly showed not only the influence of 'soft' criteria, but also the reduced importance of *price* (which was given a low ranking).

Just as the role of price has diminished as a criterion in supplier selection in many sectors, so quality has become a more important factor. Quality no longer simply applies to the product itself but also to the service and other aspects of the supplier-manufacturer relationship. For instance, a good relationship is a prerequisite to good problem solving and co-operation in product design. In

the drive to reduce the number of suppliers, the location of the vendor also plays a role. *Supplier location* can impact on the costs of transportation and response time for replacement orders. Another motivation might be to support the local or national economy and manufacturers may choose to buy locally, rather than overseas [34]. The newer, wider spectrum of selection criteria incorporates several intangible factors. Choi and Hartley's [33] study suggested that the supplier selection process needs to be modified in order to account for the intangible side of the relationship. However, the question arises: how can intangible aspects, which are difficult to measure, be integrated into the decision process?

De Boer [35] argued that supplier selection involving intangible factors is best managed by a group of decision makers. A cross-functional sourcing team usually consists of individuals who are knowledgeable about the particular selection decision to be made [1,9]. Hence, the team membership changes according to the selection problem. The purchasing manager, however, is always part of the team and they should take up the role of 'coach'. The team approach should prevent purely subjective (ad-hoc) decisions being made, at the same time, it allows for a degree of flexibility. Nevertheless, the best way to deal with soft factors in supplier selection decisions is still an open issue [3].

It appears from the literature that the structure of the sourcing team as well as the criteria used for selecting suppliers is changing. This is in response to the new challenge of selecting suppliers who have the potential to add long-term value to a manufacturer.

¹ The following 'soft' factors were chosen: closeness of past relationship, likelihood of long-term relationship, communication openness and company's reputation for integrity.

German Literature

It has been recognised that German manufacturing is comparatively slow at adopting new manufacturing concepts, such as lean production and business process re-engineering [36,37]. It could also be assumed that supplier management are also being adopted very slowly.

Reviewing the literature published in the German language, it quickly becomes apparent that most ideas are repeated from English publications and are conceptual in nature. It has to be noted that some empirical studies conducted in Germany have been published in English. These have focused on exploring the *best practices* of successful companies and have identified supplier management as a key area (e.g., [38, 39]). It is surprising that few authors have conducted empirical investigations in Germany. In order to contrast German research to the English literature given above, a brief summary of key German publications will be presented following the same headings used previously.

The Importance of Supplier Management

Many German writers have acknowledged the importance of supplier management (e.g., [40,41,42]) and today, close supplier relationships are an emerging critical success factor (e.g., [43,44,45]). However, in discussing German manufacturing industry as a whole, Friedrich et al. [46] identified that partnerships between suppliers and manufacturers are unusual and that adversarial relationships are too common.

Recently, a German Delphi-Panel of experts made the prognosis for the years 2001-2005 that suppliers will become responsible for a major part of R&D activities, whereas manufacturers will predominantly focus on their core competencies [47]. Thus, supplier management becomes increasingly critical.

Supplier Base Reduction

Homburg's [40] study of 5 industry sectors (see Table 1) is particularly relevant, as it is the only previous empirical investigation of supplier base trends. The investigation was based on a 1993 postal survey of 165 manufacturing companies. The results indicated that the majority of German manufacturers intended to maintain their supplier base (77% on average across all sectors).

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It is unfortunate, that Homburg only determined the average number of suppliers in 1993. This prompts the question of whether manufacturers had reduced their supplier bases prior to 1993 and intended therefore to keep supplier numbers stable. Therefore, another study is required.

The Supplier Selection Process

The selection process is not normally the responsibility of one individual (e.g., purchasing manager), but a group of decision makers. Whereas some authors argued that the purchasing manager has to team up with engineers for selecting suppliers (e.g., [48,49]), other authors argued for a cross-functional team approach (e.g., [41]), making decisions using well-established selection criteria such as *price, quality, delivery* and *service* ([50,51]).

Fröhlich-Glantschnig [52] argued that the selection process should only be based on objective criteria. In contrast, some authors have called for the use of 'soft' criteria [41]. Moreover, a small group of authors have seriously considered the *quality of relationship* as a potential selection

criterion [42,53]. Unfortunately, the concept quality of relationship has not been clearly defined, although it may well often be more important than price (e.g., [54]).

Conclusions on the Literature

In contrasting the published literature in English to the German it becomes evident that the overwhelming majority of German authors base their arguments on anecdotal evidence alone. The lack of empirical investigations is surprising, considering the interest in supplier management. The review of the literature leads to four main conclusions and questions:

1. Although a smaller supplier base can lead to competitive advantages, the typical size of the supplier base of German manufacturers is not clear. What is the trend in the size of the supplier base for German manufacturers?
2. There is a lack of empirical work on whether German managers perceive supplier management to be important today. Is there a mismatch between theory, which advocates that the management of suppliers is crucial, and practice?
3. Usually, it is argued that a variety of benefits result from dealing with a smaller supplier base. What are the specific advantages of working with a limited number of suppliers?
4. A cross-functional sourcing team is typically responsible for selecting suppliers. However, are such teams being used by German manufacturers (and what are the typical steps taken in the selection process and what are the latest selection criteria)?

The conclusions from the literature and the questions here raised prompted an empirical investigation of supplier management in German manufacturing industry, contrasted against practices in the UK.

Research Design

The goals of the research were:

1. To determine the trends of the size of the supplier base of German manufacturing companies and to contrast the results with findings of comparable UK companies.
2. To investigate into the importance of supplier management to German managers.
3. To explore the benefits of a reduced supplier base.
4. To investigate in detail the supplier selection process in German manufacturing.

To achieve the above aims, the methodology of Goffin et al. [1] was extended and refined. This led to the adoption of two stages for the research: a postal survey followed by a telephone survey of managers involved in supplier management. The combination of postal survey and telephone interviews was used to establish the trend in supplier management in the two countries and also to obtain an understanding of supplier management practice in Germany.

Stage 1 – Postal Survey of German and UK Manufacturing Companies

Research Instrument and Survey Details

The research used information taken from the *Best Factory Awards* (BFA) database of UK manufacturing companies. Management Today (a leading UK manufacturing magazine) and Cranfield School of Management have run the BFA programme since 1992. The data collected from more than 200 manufacturing plants each year are used for benchmarking and research (for detailed information about the programme refer to [55]). Each plant completes a detailed 16-page, confidential questionnaire covering descriptive data (e.g., cost structure), performance data (e.g., delivery reliability), the products manufactured as well as management policies (e.g., market

positioning), beside other issues. Currently, the UK-database contains high-quality data on the performance of over 1,000 manufacturing plants, including details of their supplier management. Previous Best Factory Award winners and finalists have been widely publicised (see, for example Wheatley et al. [20, 21, 56]). To enable international comparisons, the *Best Factory Awards Deutschland* (IBFA-D) database was launched in 1996. The German database now contains comparable data on manufacturing organisations in terms of industry sector, product range, size, employee number etc. [57, 58].

Purpose and Sample

As most research dealing with supplier management has been conducted in the automotive sector, the current research takes a broader sample and extends beyond this industry (as did the UK-study by Goffin et al. [1]). The research examines the issue of supplier management in three industry sectors: *engineering (including automotive), process, and electronics*.

The performance of 220 manufacturing companies (110 German; 110 English) in the selected industry sectors was analysed using the BFA databases. Furthermore, information on supplier management including trends in the size of supplier bases was compared. Therefore, it was possible to establish whether manufacturers in both countries reduced their supplier bases between 1993 and 1997 (Appendix 2 specifies the survey questions used).

Stage 2 – Telephone Survey of German Manufacturing Companies

The second stage of the research focused on supplier management exclusively in Germany. The telephone survey was necessary in order to be able to investigate some of the more complex aspects of supplier management, which could not be effectively studied using a postal survey.

Research Instrument and Interview Details

The telephone questionnaire used was based on the one developed by Goffin et al. [1]. It was translated into German by a native speaker (one of the researchers) and was checked by an independent German expert in the supplier management field. Five pilot interviews were conducted in order to check and optimise the questionnaire. They also helped to affirm that the interview structure, the individual questions, as well as the overall interview flow were relevant and applicable to German manufacturers.

One individual researcher conducted all interviews (including pilots) in his native language - in order to avoid possible errors resulting from multiple interviewers. Since the interviews were exploratory in nature, recording the conversation on tape was beneficial [59]. The interviews took 30 minutes on average and followed a structured questionnaire. Full transcripts of the interviews were produced and used in the analysis.

Purpose and Sample

A random stratified sample for the telephone survey was selected from the 110 German plants that entered the BFA in 1997 (i.e., from the German respondents to the Stage 1 survey). The sample was stratified by the three sectors. This approach ensured that a representative sample from the three industrial sectors was used for the telephone survey. The managers interviewed were senior purchasing/materials management managers with responsibility for supplier chain management.

The questionnaire used in Stage 2 was developed from one used for face-to-face interviews by the same group of researchers previously mentioned [1]. The original questionnaire had been piloted, and its reliability and validity established but modifications were necessary before it could

be used for telephone interviews. Five pilot interviews were used to verify the utility of the telephone questionnaire. The random stratified sample (of 34 interviews) consisted of 21 engineering companies, 9 electronics companies and 4 process companies. Note that as the 34 companies covered by the telephone survey had already completed the BFA questionnaire, full background data on their manufacturing operations and performance were available prior to the interviews.

Results

The discussion of the results starts by examining the survey data taken from the UK and German BFA databases. It then moves on to examine the results of the telephone survey.

Postal Survey Results

The shifts in the number of suppliers between the years 1993 and 1997 for UK and German manufacturing plants are shown in Table 2 (derived from the BFA databases).

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The table compares the average supplier bases across three industry sectors. In the electronics sector, UK plants have reduced their number of suppliers from 1993 to 1997 by 46%. In contrast, German plants have only reduced the supplier number by 8% over the same period – leaving them with, on average, twice as many suppliers (532 versus 253).

A similar trend to that seen in the electronics sector can also be observed in engineering. UK manufacturers have reduced the average supplier number of 243 in 1993 to around 155 in 1997. This

represents a 36% decrease over 4 years. In the same period comparable German plants reduced their supplier base by only 5% (from 240 in 1993 to 228 in 1997).

However, the third sector, process, shows a different situation. Whereas UK manufacturers reduced their average supplier base from 332 (in 1993) to 260 (in 1997), the German plants actually increased their supply bases from 124 to 143 over the same period.

The results indicate that UK electronics and engineering plants have greatly reduced their supplier base whilst German plants made much smaller changes. However, the question arises: were the manufacturing plants in the UK and German samples comparable? In order to verify this, a range of variables from other parts of the questionnaire was checked. These included plant size, types of product, product complexity, number of employees, etc. As presented in a previous paper, no significant differences between the UK and German plants were found on any of these variables (see [57]).

Telephone Survey Results

The Importance of Supplier Management

The respondents were asked if they considered the importance of supplier management to have increased over the last 3 to 5 years. Around 79% of managers saw the importance of supplier management to have increased. However, a sizeable minority of 21% perceived the importance of supplier management as stable, while none of the managers perceived supplier management as decreasing in importance. Commenting on the importance of supplier management, one interviewee said “*purchasing is not a single-sided business but is underpinned by a bilateral supplier-customer relationship,*” (purchasing manager - engineering sector). Similarly, a central purchasing manager from the electronics sector stated “*we are only as good as our suppliers.*” These quotes demonstrate

the typical views of managers on the significance of supplier management.

Further Supplier Base Reduction

The respondents were asked about the future development of their supplier numbers; Table 3 shows their answers.

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Although some of the respondents intend to reduce the number of suppliers, the majority plans to keep the number stable. Companies in the ‘process’ sector largely intend to keep the number constant, whereas a greater proportion of the companies in the ‘electronics’ and ‘engineering’ industrial sectors intend to reduce. It is interesting to note that of the 14 companies, who intend to streamline the supply base in the future, 12 (ca. 85%) had already reduced their supplier number in the period 1993-97. This suggests that supplier base reduction is an ongoing process.

Benefits of Reduced Supplier Base

In total, 15 of the 34 manufacturers surveyed had reduced their supplier base in the period 1993 to 1997. These respondents were asked about the benefits of reducing their supplier base – Table 4 presents their answers.

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The benefits identified by respondents were mostly related to the cost savings resulting from a smaller supplier base. In addition, managers said that the focus on fewer suppliers increased their negotiating power with their remaining suppliers. Respondents were also asked whether their organisations quantitatively monitored the advantages of a smaller supplier base. In fact, only 7 respondents' companies had quantified the benefits to some extent. Hence, for the majority of managers, the benefits of a smaller supplier base were 'perceived' rather than being based on, for example, clear financial evidence. Interestingly, Cousins [24] found similar results in the UK recently. He identified that managers did not have accurate cost information for measuring the advantages; they simply felt that a smaller supplier base was more efficient. The current study and the work of Cousins both indicate that managers believe that it is economically sound to reduce the supplier base but often fail to monitor this adequately.

Supplier Selection and Criteria

All the respondents were asked about their supplier selection process. Almost every respondent described the selection process as a team effort, involving a number of different functions. Table 5 outlines the main functions involved in the supplier selection process at the 34 companies surveyed.

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In 79% of cases, the purchasing department was involved, followed by quality management and research & development. Normally, three functions make up the team responsible for supplier selection. Surprisingly, of the 34 firms surveyed, only two manufacturers integrate the marketing function into the sourcing teams. Recently, Homburg et al.'s [61] empirical work on German and US

manufacturing indicated that marketing is normally active in its classical role (i.e. promotion and customer contact) but is not highly involved with suppliers. This, together with the results of the current investigation, suggests that marketing take a predominately *downstream* view of the supply chain. In other words, while marketing is actively involved in managing the manufacturer-customer relationship, it is not involved in managing the supplier-manufacturer interface in Germany.

Each of the companies was asked about their supplier selection processes and the typical stages were identified. Although, individual procedures varied to some extent, they can be aggregated into the main nine steps outlined in Table 6.

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The selection procedure starts with an initial requirement for a part or component, or a specific customer order. The purchasing manager then identifies potential suppliers and initiates the bidding process. The sourcing team discusses the options on the basis of the information received before inviting a limited number of suppliers for further personal discussions. After drawing up a short-list, suppliers are asked to deliver samples, which the quality manager subsequently evaluates. Then the purchasing manager negotiates the price and delivery conditions, etc. Sometimes it is necessary to conduct supplier audits before entering the final phase. Here, the sourcing team decides on which supplier(s) to buy from and the purchasing manager places the order(s).

The telephone survey was used to clarify which criteria form the basis for selecting suppliers. Thirty respondents mentioned *price*, whereas 27 managers referred to *product quality* and 23 to *delivery performance*. Other criteria were mentioned somewhat infrequently, as shown in Table 7.

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The top three selection criteria identified are the same as those advocated by the German literature. Although the manufacturers interviewed did not mention the *location* of the supplier, it might be that is a pre-requisite. Suitable supplier locations ensure speedy delivery, make direct communication easier.

In general, some German companies surveyed favoured a combination of *price and quality* while others used *price and delivery* for supplier evaluation purposes. The majority, however, took all three factors into account when selecting a supplier. This shows that *price* always plays a role in selecting suppliers, although it has to be emphasised that this factor is not the single most important criterion. A purchasing manager from the electronics industry summarised the situation as follows “*in the past, the price was the most important and then quality came in. Yet, if the quality is not right or we do not get the promised component delivered, a ‘good price’ will not help us run our business.*”

The change in the relative importance of the selection criteria confirms a trend already observed in America [32]. In the US, quality initially replaced price as the most important criteria before wider aspects of the supplier-manufacturer relationship were adopted into the decision process (cf. [33]). In the future, will German manufacturing follow the US in adopting “softer” relationship criteria into account when selecting suppliers?

The current investigation cannot answer this question, but it became apparent that softer issues, such as *cultural fit* or *problem solving capabilities*, are only rarely considered in the selection decision in German manufacturing today.

Summary and Conclusions

It is evident from the literature that supplier management is critical to manufacturers today and likely to remain so for some time to come. The empirical results identified a sharp contrast between UK manufacturers in the electronics and engineering sectors, which had significantly reduced their supplier bases and many German companies which had not. Previous research by Homburg [40] indicated that German manufacturers expected their supplier base to stay unchanged in the future. The empirical evidence from the present study goes beyond Homburg's investigation and shows that many manufacturers are planning to reduce their supplier base in the near future.

Managers at the companies that have reduced their supplier base, perceive significant advantages to this approach. These include a range of cost reductions and the benefits resulting from closer manufacturer-supplier relationships. However, very few companies have actually used measures to monitor the benefits gained.

The research showed that the classical selection criteria (price, quality and delivery) are still the most popular ones for selecting suppliers in Germany. The process of selection itself typically starts with a requirement from an in-house technical department, or from a specific customer order. Then the purchasing manager obtains offers from potential suppliers and the procedure continues with various evaluation stages. Finally, a cross-functional sourcing team selects the most suitable supplier(s).

The findings have implications for researchers, who need to collect more empirical evidence on supplier management in Germany. For example, it is necessary to understand why some manufacturers have reduced their supplier numbers, although most have not. A case study approach would probably be the most appropriate methodology for exploring this issue and this could be done in the sectors discussed in this paper, as well as other industries. Some related questions also require further research: what is the appropriate strategy for suppliers to differentiate themselves from their

competitors? Similarly, do subjective “soft” factors about supplier-manufacturer influence the supplier selection process, or is it all based on objective quantitative criteria?

The results of the research have strong ramifications for manufacturers – they indicate that many German companies have yet to take advantage of a reduced supplier base. In addition, for companies starting to reduce their supplier base need to put measures in place to identify the real, as opposed to perceived, business advantages. This would also provide important data for companies considering supplier base reduction – it would give them a clear view of potential savings.

However, the findings are not only relevant to manufacturers, they also have implications for suppliers. If more German manufacturers decide to reduce their supplier base, then suppliers need to ensure that the combination of materials, parts, components and services they offer is attractive to manufacturers. Consequently, suppliers need to hone their competitive strategy accordingly.

Currently there is a very strong debate about the international competitiveness of German manufacturing industry (e.g., [37,62]) and this topic became generally known as the *Standort Deutschland* (Germany as a viable *location* for manufacturing) discussion (see, for example, [63][64]). The degree to which Standort Deutschland has been debated in the press is demonstrated by the fact that in the past three years well over 1,000 articles on this issue were published in two leading German newspapers, the *Frankfurter Allgemeine Zeitung* and the *Süddeutsche Zeitung*². Germany has a substantial manufacturing industry, accounting for 25% of Gross Domestic Product (GDP) as well as employing an equally high rate of the workforce in this sector (65). However, high taxes and labour costs are leading some companies to question the viability of producing in Germany [66]. Some researchers have noted that best practices, such as ‘lean production’ could help companies reduce the cost of manufacturing in Germany. Surprisingly, however, such management concepts have only been slowly adopted by German industry [36,37]. It appears that supplier base

² As determined by a search of the Financial Times *FTPProfile* database.

management is another concept that is only being slowly adopted. It will be interesting to see how long it takes before more German manufacturers recognise that fewer suppliers can mean more effective supplier base management.

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Appendices

Appendix 1: Definition/Categories of Industry Sectors in Goffin et al.'s [1] Study

Industry Sector	Definition/Categories
Process	<i>Chemical, Pharmaceutical, Metal Manufacture, Man-made Fibres</i>
Engineering	<i>Heavy Engineering, Mechanical Engineering, Motor Vehicles and Parts, Other Transport Equipment, Instrument Engineering</i>
Electronics	<i>Office Machinery, Data Processing Equipment, PCs, Electrical Components and Electronic Equipment</i>
Household	<i>Rubber and Plastics Processing, Clothing, Furniture, Food/Drink and Tobacco, Printing and Publishing</i>

Appendix 2: Number of Suppliers

The main question in the 16-page Best Factory Awards 1997 questionnaire, which relates to the size of the supplier base, is given below. Note that the dates given change each year (i.e., they relate to the number of suppliers two and four years ago).

How many suppliers do/did you have for manufacturing purposes:

	Number
Currently	
In 1995	
In 1993	

Table 1: Expectations of Supplier Number Development

Industry Sector	Sample (n)	Expected Future Development of Supplier Number (in %)		
		Extreme Decrease	Stable / Insignificant Changes	Extreme Increase
Chemicals	48	10	83	6
Electronics	36	22	67	11
Metal Processing	33	12	85	3
Machine Building / Engineering	31	13	77	10
Motor Manufacturing / Engineering	17	24	65	12
Total	165	15	77	8

Source: Adapted from Homburg [40, p. 823].

Table 2: Change within the UK and German Supplier Bases

Industrial Sector	Country	Sample (n)	1993	1995	1997	Change in % (1993-97)
Electronics	<i>UK</i>	28	472	341	253	-46%
	<i>Germany</i>	20	578	563	532	-8%
Engineering	<i>UK</i>	56	243	201	155	-36%
	<i>Germany</i>	78	240	234	228	-5%
Process	<i>UK</i>	26	332	297	260	-22%
	<i>Germany</i>	12	124	138	143	+15%

Table 3: Future Change within the Supplier Bases in German Manufacturing

Industrial Sector	Sample (n)	Increasing	Stable	Reducing
Electronics	9	0	4 (44%)	5 (56%)
Engineering	21	2 (10%)	11 (52%)	8 (38%)
Process	4	0	3 (75%)	1 (25%)
Overall	34	2 (6%)	18 (53%)	14 (41%)

Table 4: Benefits of Having Reduced the Supplier Number

Benefits	Percentage
Less resources / effort / (administration) costs required	53%
More power in negotiations / Increase importance to suppliers	53%
Advantages in Logistics / Fewer inspections	33%
Know-how transfer easier and quicker / Less risk spreading know-how to competitors / Earlier involvement in product development processes	33%
More intense and direct contact / Improvement of communication	27%
An opportunity to plan for the future	13%
Appointing more tasks to fewer suppliers (e.g., to <i>System Suppliers</i>)	13%
Employing KANBAN Systems	7%

Table 5: Typical Functions Involved in Selection Process

Functions	Percentage
Purchasing	79%
Quality Management	56%
R&D	41%
Engineering	32%
MD / Top Management	26%
Production Manager	15%
Factory Manager	6%
Marketing	6%
Project Leader	6%

Table 6: Typical Steps Taken in the Supplier Selection Process

- | |
|--|
| <ol style="list-style-type: none">1. Engineering / R&D have an initial product idea or the end-consumer places an order for a particular product;2. Purchasing manager enquires information/offers from potential suppliers or from specific suppliers (if required by the end-consumer or R&D);3. The cross-functional sourcing team discusses the options;4. The purchasing manager invites potential suppliers for first discussions;5. Suppliers on the short-list deliver samples;6. Quality manager evaluates the samples;7. Purchasing manager negotiates with suitable suppliers;8. Sometimes, an audit (before selection or shortly afterwards) will be conducted;9. The team decides and purchasing manager places the order. |
|--|

Table 7: Selection Criteria (Top 15)

Selection Criteria	Frequency
Price	30
Quality	27
Delivery	23
Service	4
Relationship History	4
Certificates	4
Volume	3
Know-how / Competence	3
Flexibility	3
Supplier's Equipment	2
Commitment	1
Communication	1
Size of Organisation	1
Trust	1
Technology	1